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Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of:	)	
	)	
Federal-State Joint Board on Universal Service	)	CC Docket No. 96-45
	)	
	)	
Forward-Looking Mechanism for High Cost Support for Non-Rural LECs	)	CC Docket No. 97-160
	)	

REPLY COMMENTS OF GTE SERVICE CORPORATION

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SUMMARY

In its Comments, GTE demonstrated that a forward-looking cost proxy model based on a hypothetical network will significantly understate the actual forward-looking costs of providing universal service. Allocating inadequate funding for universal service would violate the Act's requirement that funding be sufficient and leave local exchange carriers ("LECs") without the revenues necessary to maintain and upgrade their networks. Carriers cannot provide service based on hypothetical costs, and customers will not be satisfied with hypothetical service. In contrast, using carrier-specific, state-approved engineering models will yield accurate, reliable estimates of actual forward-looking costs, ensuring that all carriers receive sufficient funding. Use of such engineering models should be only interim, however. The most efficient long-term solution for allocating universal service funds is a competitive-bidding mechanism that uses market forces to identify the most efficient providers of universal service.

In response to the Commission's specific requests for comment, the majority of parties agreed that the more real-world data are used to determine costs, the more accurate the cost estimates will be. For determining the location of remote and host switches, there is strong support for using the Bellcore Local Exchange Routing Guide data. Similarly, there is general consensus that using actual switch locations will most accurately reflect the capacity needs of LEC networks. There was also general agreement that port and usage costs should be separated (with 100 percent of the port costs attributed to universal service) and that all usage costs relating to services within the universal service package should be attributed to universal service. For allocation

of switching costs, several LECs explained that Bellcore's Switching Cost Information System generates the most accurate cost estimates and that the Hatfield Model's flat 30 percent attribution would produce inaccurate results.

For transport costs, the record demonstrates that the Hatfield Model is wholly unreliable. For example, as GTE and SBC noted respectively, Hatfield's transport algorithm fails to account for the Pacific Ocean in the state of Hawaii and engineers a network that deprives the majority of Texas residents of both intraLATA toll and exchange access services. As with switching, the Commission should use actual LEC data to determine forward-looking transport costs.

Contrary to the claims of AT&T and MCI, several comments confirm that the Hatfield Model suffers extensive shortcomings and severely understates the level of funding necessary. The switching costs developed by the Hatfield Model do not reflect a forward-looking network. First, the Model does not include host/remote relationships, and even if it did, the host/remote architecture could not function because the umbilicals needed to connect the remotes to hosts are not contained in the Model. Second, the costs of growth lines, embedded switch bases, and software purchased subsequent to an initial switch installation are completely ignored. Third, the Model does not assign universal service costs to the port to reflect actual switch type and usage.

The interoffice facilities, signaling, and local tandem components developed by the Hatfield Model also understate actual costs in several ways. The Model does not take into account sufficient interoffice trunking, and tandem-to-tandem, E911, and announcement trunks are not included in Model calculations. In addition, the Model renders the entire SS7 system inoperable and unreliable. Finally, improper remote

assumptions lead to insufficient interoffice facilities ("IOF") placement. Although the BCPM Model includes some of the elements recommended by GTE, such as the use of LERG data for switching, GTE believes that any cost proxy model will not provide an accurate assessment of costs. However, since the new BCPM Model has not been released, GTE has been unable to examine it fully.

For these reasons, GTE urges the Commission to use carrier-specific, state-approved engineering models to determine universal service funding until a competitive-bidding mechanism can be established.

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REPLY COMMENTS OF GTE SERVICE CORPORATION

GTE Service Corporation and its affiliated domestic telephone operating companies (collectively "GTE")[1] respectfully submit their Reply Comments on the Further Notice of Proposed Rulemaking ("FNPRM") in the above-captioned proceedings.[2] The comments confirm that no model based on a hypothetical network will reasonably estimate the costs of providing universal service and that the Hatfield Model in particular severely understates universal service funding requirements. Therefore, GTE urges the Commission in the interim to use carrier-specific, state-approved engineering models to ascertain the costs of providing universal service. As rapidly as possible, the Commission should implement a long-term competitive bidding mechanism that will assure sufficient and efficient funding.

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[1] GTE Alaska, Incorporated, GTE Arkansas Incorporated, GTE California Incorporated, GTE Florida Incorporated, GTE Hawaiian Telephone Company Incorporated, The Micronesian Telecommunications Corporation, GTE Midwest Incorporated, GTE North Incorporated, GTE Northwest Incorporated, GTE South Incorporated, GTE Southwest Incorporated, Contel of Minnesota, Inc., and Contel of the South, Inc.

[2] FCC 97-256 (rel. July 18, 1997).

As discussed in Section I, the vast majority of commenters concur that universal service funding should be calculated based on the actual forward-looking costs of providing the supported services. Section II confirms that no cost proxy model can adequately account for the plethora of factors affecting network costs, virtually guaranteeing that carriers will not receive sufficient funding to provide affordable universal service to their customers, as required by Congress. In Sections III, GTE explains in detail how the Hatfield Model fails to yield reliable estimates of the actual costs of providing universal service to customers. The new BCPM Model referenced by BellSouth, U S WEST, and Sprint has not been made available, so GTE has not had the opportunity to evaluate it fully. Several of the Model inputs confirm GTE's positions, such as the use of LERG data for switching. However, for the reasons explained below in Section I.A, GTE believes that any cost proxy model, including the new BCPM, will not be able to account accurately for all network costs associated with the provision of universal service.

I. THE COMMENTS PROVIDE SIGNIFICANT SUPPORT FOR USE OF STATE-APPROVED, CARRIER-SPECIFIC ENGINEERING MODELS FOR DETERMINING UNIVERSAL SERVICE FUNDING.

A. A hypothetical forward-looking cost proxy model will understate the actual forward-looking costs of providing universal service, in violation of the Act's mandate that universal service support be sufficient.

The actual costs of providing universal service are driven by the existing network plant, which consists of the most efficient technology and design available at the time each portion of the network was installed. Proxy models, and the Hatfield Model in

particular, ignore these real-world costs by attempting to estimate costs of a hypothetically most efficient network consisting of currently available technology, which no company could actually have. Indeed, the Hatfield Model even fails to account accurately for the costs of operating a hypothetically most efficient network. Its flaws include using an inadequate mathematical function as the foundation for end office switching investment calculations, violating accepted switch engineering guidelines, overlooking critical switching components, excluding various element costs, and using entirely unreliable input data. Thus, even if the Commission were justified in trying to adopt a model representing the hypothetically most efficient firm, the Hatfield Model would not measure these forward-looking costs accurately.

To satisfy the Act's sufficiency requirement, the Commission should permit individual carriers to use state-approved engineering models to derive their actual forward-looking costs of providing universal service.[3] The Commission can then initiate a proceeding to develop a competitive bidding mechanism and allow market forces to allocate universal service support. Such an approach has the dual benefits of eliminating the need for the Commission to waste resources developing and improving inevitably inaccurate models and allowing competitive forces to award universal service funding to the most efficient carrier.

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[3] As GTE explained in its Comments, the Commission also must establish a mechanism for allowing LECs the opportunity to recover embedded costs incurred from the cross-subsidization that was used to fund universal service prior to the Act. Comments of GTE, CC Docket Nos. 96-45, 97-160 at 5-6 (filed Aug. 8, 1997) ("GTE Comments").

B. It is impossible to create a cost proxy model which adequately accounts for the multitude of factors affecting universal service costs.

In addition to GTE, several commenters, including Bell Atlantic/NYNEX, Ameritech, SBC, and ITCs, Inc., challenged the Commission's premise that a proxy model based on hypothetical costs can ever fully account for the actual costs of funding universal service.[4] As ITCs explained:

> Hypothetical accounting mechanisms and the costs they produce are never long-lived because, after all, investors do not invest based on hypothetical costs, customer revenues cannot be expected to cover hypothetical costs, suppliers do not ship or construct networks based on hypothetical costs and neither hypothetical dividends, interest payments, nor hypothetical taxes are ever paid. It is important to note that the only area where hypothetical mechanisms prevail is on the books of businesses which have failed.[5]

Local exchange carriers ("LECs") have invested billions of dollars building their networks based on their best estimates of future demand and the most efficient technology available at the time. These costs are not hypothetical, but were prudently incurred and subject to review by state commissions and the Commission. The Commission cannot expect a hypothetical model to cover the actual costs of providing

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[4] Joint Comments of Bell Atlantic and NYNEX, CC Docket Nos. 96-45, 97-160 at 1-2 (filed Aug. 8, 1997) ("BA/NYNEX Comments"); Comments of Ameritech to Further Notice of Proposed Rulemaking, CC Docket Nos. 96-45, 97-160 at 1-2, Appendix (filed Aug. 8, 1997) ("Ameritech Comments"); Initial Comments of Nevada Bell, Pacific Bell, and Southwestern Bell Telephone Company, CC Docket Nos. 96-45, 97-160 at 1 (filed Aug. 8, 1997) ("SBC Comments"); Comments of ITCs, Inc., CC Docket Nos. 96-45, 97-160 at 3 (filed Aug. 8, 1997) ("ITCs Comments").

[5] ITCs Comments at 3.

service any more than GTE could expect its customers to be satisfied with hypothetical telephone service rather than actual service.

Other commenters also emphasize that the individual circumstances of their service areas must be incorporated into any proxy model, effectively transforming the proxy model into an engineering model. For example, the Puerto Rico Telephone Company ("PRTC") notes that only 74 percent of the households in its service area have a telephone, and as a result, its loop infrastructure is different than the population density would suggest.[6] TDS points out that any proxy model must take into account the effect of competitive entry in rural areas:

> where low traffic volume results from sparser population and fewer concentrated customer clusters, even a single competitor can profoundly affect the fill factor for facilities, the cost per line and the accuracy of a model's assumptions about the different configurations and availability of growth capacity.[7]

The effect of competition on recovery of rural area costs is of particular concern to GTE because it serves a large number of noncontiguous rural areas. Thus, any proxy model, regardless of whether it would be used for large or small LECs, must take account of these factors.

The issues raised by PRTC and TDS illustrate the level of complexity a cost model would have to accommodate in order to reflect accurately factors such as low

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[6] Comments of Puerto Rico Telephone Company, CC Docket Nos. 96-45, 97-160 at 3 (filed Aug. 8, 1997) ("PRTC Comments").

[7] Comments of TDS Telecommunications Corporation, Inc., CC Docket Nos. 96-45, 97-160 at 4 (filed Aug. 8, 1997) ("TDS Comments").

subscribership and competition in rural areas. PRTC and TDS, like all other LEC commenters, are thus rightfully skeptical that any cost proxy model will be adequate to ensure sufficient universal service funding. As TDS also emphasizes, "[t]here has not yet been a model that adequately predicts costs even for larger LECs, let alone for the far more diverse costs and investment profiles of rural LECs."[8] The nonexistence of such a model, the tremendous complexity that such a model would have to incorporate to have any hope of being accurate, and the relative simplicity and proven accuracy of engineering models make it clear that the Commission should abandon its efforts to develop a mandatory cost proxy model.

II. THE RESPONSES TO THE COMMISSION'S INQUIRIES FURTHER DEMONSTRATE THAT REAL-WORLD DATA PROVIDE THE MOST ACCURATE ASSESSMENTS OF COSTS. (Sections III.C.3-4)

A. The Bellcore Local Exchange Routing Guide ("LERG") data should be used to identify the location of remote and host switches. (Section III.C.3.a)

The comments support GTE's position that the factors affecting a company's decision to use a remote rather than a host switch are too complex to be represented by an algorithm.[9] For example, ITCs notes that carriers sometimes find use of digital loop carriers interconnected with a ring of fiber which includes a host to be a more

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[8] TDS Comments at 3.

[9] BA/NYNEX Comments, Attachment at 1-2; SBC Comments at 2-4; Ameritech Comments at 4-5; Joint Comments of BellSouth Corporation, BellSouth Telecommunications, Inc., U S WEST, Inc., and Sprint Local Telephone Companies to Further Notice of Proposed Rulemaking Sections III.C.3.a-d, III.C.4, CC Docket Nos. 96-45, 97-160, Attachment 1 at 1-3 (filed Aug. 8, 1997) ("BellSouth et al. Comments").

efficient approach than using a host/remote configuration.[10] Such determinations can only be made after examining the overall network configuration and customer base and cannot be replicated by an algorithm.

As GTE explained in its Comments, LERG data represent the decisions companies have actually made after weighing the numerous considerations, including future demand and the need to provide advanced services, that influence switch configurations. Therefore, there is no need to engage in the hopelessly complex task of deriving an algorithm when accurate, exact information is already available. As recommended by numerous commenters, the Commission should use the real-world switch information contained in the LERG.[11]

AT&T and MCI suggest that the obvious solution of relying on the current placement of host/remote switches is inappropriate because this would violate the Commission's principle that forward-looking costs must be calculated based on "optimal network configurations."[12] Their understanding of appropriate cost computation is misguided. The forward-looking costs of providing universal service should be determined using each LEC's current network design. As TDS points out:

> the investment in facilities actually deployed does not go away when a new approach that becomes available widens the choice of switching design strategies. In the real world,

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[10] ITCs Comments at 4. *See also* TDS Comments at 5.

[11] *See, e.g.*, SBC Comments at 2; BA/NYNEX Comments, Attachment at 1; Ameritech Comments at 4-5.

[12] Comments of AT&T Corp. and MCI Telecommunications Corporation, CC Docket Nos. 96-45, 97-160 at 8 (filed Aug. 8, 1997) ("AT&T/MCI Comments").

> no investor scraps and redesigns its network every time technology evolves; it would be a waste of society's resources if such a "slash and burn" strategy were the case.[13]

State commissions verify that LECs make prudent investments at the time costs are incurred. The Commission should not second-guess these decisions based on future technological developments that could not have been known to either LECs or state commissions at the time the investment decisions were made.[14]

B. Actual switch locations most accurately reflect the capacity needs of the LECs' networks. (Section III.C.3.b)

The Commission has proposed that the cost proxy model should assign additional switches to a wire center when the model predicts that capacity constraints have been exceeded.[15] No model is necessary, however, because carriers have already determined the optimal number of switches to meet predicted needs in each study area. There is no reason to believe that carriers have not been efficient in their switch deployment decisions or that the values produced by the Hatfield Model or any other proxy model are more accurate than real-world conditions.[16] As TDS notes, capacity constraint decisions are not as easy as adding another switch to a wire center:

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[13] TDS Comments at 6.

[14] As an alternative to actual switch placements, AT&T and MCI recommend the algorithm used in the Hatfield Model, which allegedly determines when remote switches would be used in an efficient network. AT&T/MCI Comment at 5-9. As explained in Section III below, the Hatfield Model's algorithm regarding switch placement is fatally flawed.

[15] FNPRM, ¶ 124.

[16] See Ameritech Comments at 5; SBC Comments at 2-5; BA/NYNEX Comments at 1-

(Continued...)

> In practice, a LEC wire center would be designed with the capacity to handle the forecast traffic. Rather than collocating expansion switches in an existing wire center, additional switch sites may be deployed in large markets to avoid the increased risk to public safety and higher outside plant cost inherent in over-centralization.[17]

These types of factors cannot be included in a proxy model, making actual switch deployment the best indicator of capacity constraints.

C. Switching costs must be attributed in the same way they are incurred. (Section III.C.3.c-d)

There is general consensus that the Commission's proposal that the port and usage costs should be separated, with 100 percent of port costs being allocated to universal service, be adopted.[18] Most commenters also agree that all usage costs relating to designated services should be attributed to universal service since "[f]orecasted or predicted data may not accurately depict actual local switch usage."[19]

The Commission requested comment on the best method for determining what portion of the switch costs should be attributed to the port. Bellcore's Switching Cost Information System ("SCIS") is the most accurate method to make this determination.

(...Continued)
2; TDS Comments at 6.

[17] TDS Comments at 6.

[18] *See* SBC Comments at 5; Ameritech Comments at 7; BA/NYNEX Comments, Attachment at 4-5; Comments of Aliant Communications Co., CC Docket Nos. 96-45, 97-160 at 3 (filed Aug. 8, 1997) ("Aliant Comments"); BellSouth et al. Comments, Attachment 1 at 6-7; AT&T/MCI Comments at 13.

[19] SBC Comments at 5. *See also* Ameritech Comments at 5; Aliant Comments at 3; BellSouth et al. Comments at 7; AT&T/MCI Comments at 13.

As SBC explained, "LECs currently have cost models which can be used to calculate the percentage of port costs for switches currently being deployed by LECs as well as other switching costs incurred by LECs. Southwestern Bell Telephone ("SWBT") uses data generated by Bellcore's Switching Cost Information Systems ("SCIS") to determine actual port cost percentages."[20] Similarly, BellSouth states that the an "Audited LEC Switching Model," which is what SCIS is, should be used to attribute switching costs.[21]

AT&T and MCI nonetheless complain that since "any allocation will have some indeterminacy," the Commission should use the Hatfield Model assumption assigning 30 percent of total switch costs to the port.[22] As explained in Section III below, the Hatfield Model's estimate of 30 percent will produce wildly inaccurate results in many cases and cannot serve as a substitute for actual costs.

D. Predicting forward-looking costs based on actual interoffice facilities ("IOF") design is far superior to using the Hatfield Model. (Section III.C.4)

The most accurate way to estimate the forward-looking costs of interoffice facilities is to determine the location and type of the relevant facilities and calculate actual transport distances. This method ensures that the estimated costs are based on a network that meets both regulatory requirements and engineering standards. As GTE explained in its Comments, the estimates of interoffice costs generated by the Hatfield

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[20] SBC Comments at 6-7. *See also* Ameritech Comments at 7-8; Aliant Comments at 3.

[21] BellSouth et al. Comments at 6.

[22] AT&T/MCI Comments at 13.

Model are not only inaccurate, but also reflect the costs of a network which would not provide sufficient reliability, or even service, to all customers.[23]

Other ILECs echo these concerns. For example, Aliant notes that version 3.1 of the Hatfield Model does not accurately compute the distance on an optical fiber ring when applied to a Aliant's rural territory.[24] Even more egregious, SBC has discovered that Hatfield Model 4.0's algorithms predict that SWBT will need only 5.5 tandem switches to serve almost 9 million access lines in 16 LATAs in Texas. Since SWBT cannot legally use a single tandem to serve multiple LATAs, it must use 16 tandem switches in Texas. "The result of the Hatfield model is a Texas network that cannot provide intraLATA toll or exchange access for most of the state!"[25] In Section III below, GTE explains in further detail the problems with the Hatfield Model transport algorithms.

III. THE HATFIELD MODEL DOES NOT ACCURATELY PREDICT COSTS.

Contrary to the assertions of AT&T, MCI, and Worldcom, the Hatfield Model should not be used as a means to calculate the forward-looking economic cost that ILECs would incur to provide universal service. GTE, in its initial comments filed in this proceeding, documented a multitude of errors contained in the Hatfield Model's switching, interoffice, signaling, and local tandem platforms. These errors, as GTE has

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[23] GTE Comments at 15-24. *See also* Ameritech Comments at 8-9; SBC Comments 7-9; Aliant Comments at 3.

[24] Aliant Comments at 3. Again, GTE is particularly concerned with any model shortcomings which affect rural areas since many of GTE's service areas are considered rural.

[25] SBC Comments at 8.

shown time and again, render the Hatfield Model incapable of being used for its purported purpose.

AT&T and MCI, as the Hatfield Model's primary supporters, submitted joint comments touting the advantages of using the Hatfield Model and attempting to explain how the Model satisfies the issues raised by the Commission in its FNPRM. A close review of the AT&T/MCI comments, coupled with a careful analysis of the Hatfield Model, shows that the claims made by the Hatfield proponents are not supported by the Model's actual structure and assumptions. The most compelling reasons why this Commission should reject the Hatfield Model were first presented in GTE's initial filing. These rebuttal comments discuss the inconsistencies and fallacies of the AT&T and MCI joint comments regarding the Hatfield Model.

A. The switching component of the Hatfield Model is fatally flawed. (Section III.C.3)

AT&T and MCI agree that "attempting to model the optimal, forward-looking mix of switch types would be extremely difficult at best."[26] They further agree that:

> in order to determine the optimal switch type for a particular wire center, a dynamic algorithm must, at a minimum, account for the types of switches at other wire centers, the manufacturer, capacity, and capabilities of those switches, and the services the wire center being optimized must provide. The selection of a particular type of switch for a wire center, however, impacts the optimal decision for every other wire center.[27]

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[26] AT&T/MCI Comments at 7.

[27] *Id.* at 7.

The Hatfield Model's switching platform, however, ignores each and every one of these "optimal decision" components.

1. The switching costs developed by the Hatfield Model do not reflect a forward-looking network. (Section III.C.3)

The switching costs developed by the Hatfield Model are based on an incorrectly modeled network and should therefore be disregarded by the Commission. Despite AT&T's and MCI's contention to the contrary, the Hatfield Model does not assume the existence of any remote switches, ignores the cost implications of adding growth lines, and ignores the embedded switch base. Such modeling assumptions and platform construction render the Hatfield Model unusable.

a) The Hatfield Model does not model host/remote relationships. (Section III.C.3.a)

AT&T and MCI assert in their joint comments that the Hatfield Model captures the forward-looking costs of host, stand-alone, and remote switches.[28] However, AT&T and MCI have admitted in responses to data requests in various state proceedings that the Hatfield Model *does not* contemplate any host/remote switch arrangements.[29] Moreover, even if the Hatfield Model did contemplate remote switches (which it does not), the host/remote architecture could not function because the umbilicals needed to connect the remotes to hosts are not included in the Model – a fact AT&T and MCI

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[28] *Id.* at 4.

[29] *See, e.g.*, Second Set of Data Requests of Pacific Bell Concerning January 13, 1997 Cost Filing Made by AT&T Communications of California, Inc. and MCI Telecommunications Corporation, R. 93-04-003, I.93-04-002, Request No. 14,

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have admitted to in various data request responses.[30] Thus, while AT&T and MCI purport to agree with the Commission that remote switches should be modeled, the Hatfield Model simply does not account for the host/remote arrangement.[31]

AT&T and MCI attempt to defend the Hatfield Model's failure to account for remote switches by claiming that the Hatfield Model relies upon "public data to construct a switching cost curve that reflects all available information about the recent switch purchases and hence the 'market' view of the efficient forward-looking mix of different switch types."[32] AT&T and MCI also assert that the Hatfield Model's "market-based averaging approach is straightforward and verifiable, and, because it reflects market data and actual LEC purchasing practices ... it is likely to produce a reasonably accurate estimate of actual forward-looking costs."[33]

Even if one agrees with the Hatfield Model's use of an "averaging" approach (which GTE does not), the data used by the Hatfield Model is neither verifiable nor forward-looking. The Model uses a per line price, taken from a Northern Business

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February 11, 1997.

[30] *See, e.g.*, Third Set of Data Requests of Pacific Bell Concerning January 13, 1997 Cost Filing Made by AT&T Communications of California, Inc. and MCI Telecommunications Corporation, R. 93-04-003, I.93-04-002, Request No. 3, February 18, 1997.

[31] Responses of AT&T to WITA's First Set of Data Requests, Washington Utilities and Transportation Commission, Request No. 11, Docket Nos. UT-960369,-70,-71, April 22, 1997.

[32] AT&T/MCI Comments at 5-6.

[33] *Id.* at 6.

Information ("NBI") Study, as a means for generating a switch cost curve based on prices LECs purportedly paid for new switches in 1995.[34] GTE has been unable to verify any of the NBI results and has not reviewed the source data behind the NBI conclusions. GTE therefore cautions the Commission against relying on the NBI Study at face value. Until the NBI values can be validated, the Hatfield switch curve must be rejected.

AT&T and MCI nonetheless claim that the NBI Study's figures are representative of the forward-looking switch technology mix the LECs will deploy. An examination of that portion of the NBI Study that the Hatfield Model relies upon to establish switch prices, however, shows that the data *do not* represent the switch technology mix the ILECs will deploy. Specifically, the NBI Study reveals that in 1995, 914 remote switches and 259 host switches were *purchased* by LECs.[35] In other words, 78 percent of switches *purchased* in 1995 by LECs were remotes. When one examines the number of *in service* switches found in the NBI Study for 1995, only 55.59 percent of the switches are remotes. Further examination of this study reveals that NBI projects that in the year 2000, there will be 12,823 LEC host switches, and 18,853 LEC remote switches – or 59.55 percent *in service* remote switches. The Hatfield Model proponents, by claiming that the NBI Study reflects the forward-looking switch technology mix ILECs will deploy, incorrectly assume that 78 percent of deployed switches will be remote switches – a percentage that the NBI Study itself refutes.

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[34] 1996 NBI Study, Exhibit 3-37, Line 208.

[35] *Id.*, Exhibit 3-35, Lines 70-72

Clearly, the switch costs assumed by the Hatfield Model rely too heavily on remote configurations, even though the Model does not specifically account for any host/remote architecture. The error in relying on too many remote switches when estimating switch costs is greatly magnified when one recognizes that remote switches do not include some expensive common equipment found in host switches (*e.g.*, central processors). Relying upon an inordinate amount of relatively "less expensive" remote switches to generate a switch cost curve, which is precisely what the Hatfield Model does, enables the Model to significantly understate switch investment and expenses.

In sum, remote switches and their associated costs are not adequately accounted for in the Hatfield Model. Consequently, the Model cannot be the basis for developing universal service switching costs. The Commission should reject the Hatfield Model and instead rely upon an engineering approach that incorporates the actual costs incurred by LECs for switch deployment.

b) Growth lines must be included in a forward-looking cost model. (Section III.C.3.b)

AT&T and MCI contend that there is no price difference between initial and growth line purchases. This contention is easily rebutted by examining the same NBI Study the Hatfield modelers rely upon to generate switch costs for the Model. While the NBI Study itself has not been validated, the Study nevertheless clearly identifies initial line and growth line prices. It displays the cost of an initial, bundled (purchased with a switch) digital line price for all LECs, as well as the price LECs paid for a growth, or an unbundled (purchased without a new switch) digital line, revealing that growth lines cost 9.7 percent more than initial line purchases.

Regardless of the NBI Study's validity, common sense and engineering experience indicate that growth lines are more expensive than initial line purchases. This price differential makes particular sense given that (1) initial line purchases are subject to competitive bidding, while growth (unbundled) line prices are not; (2) growth line costs must account for the additional independent installation efforts which do not benefit from the efficiencies gained during an initial installation; (3) initial lines are known, negotiated quantities, ordered well in advance of the installation date (in some cases up to two years in advance), while growth lines are, in some cases, required immediately, providing the manufacturer no lead time whatsoever; and (4) switching equipment is not usually stockpiled by LECs, meaning that when demand requires the addition of growth lines, due to Internet use for example, growth line purchases will be subject to list, or in some cases, premium pricing.

The Hatfield developers state that the Hatfield Model would only provision the exact number of lines in service today,[36] failing to account for any additional line capacity. Growth lines should, however, be accounted for in the Hatfield Model because the Model does not provide adequate spare administrative line capacity required for maintenance and load balancing. This lack of adequate spare capacity is easily validated by comparing the Model's line output for each jurisdiction to the number of lines currently in service as of the ARMIS report date. They are identical. Efficient telephone companies would provision their networks with growth lines during the initial installation, normally to serve two years worth of growth. The Hatfield Model fails to

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[36] *Id.*

follow this standard engineering practice. This means that the Hatfield Model's switching cost estimates should include the cost of adding more expensive growth lines on a daily basis.[37] The Hatfield Model's failure to do so prevents it from accurately estimating switch costs.

AT&T and MCI also argue that even if there were a difference in cost between initial and growth lines, such a difference would be irrelevant because the time value of money will make the costs of growth lines in the future the same as the cost of new switch capacity now.[38] This argument is inaccurate, at best. It would be sheer happenstance if the present value of the cost of growth lines equated to the cost of initial lines. Moreover, to determine the most economical choice for expanding capacity, a LEC must compare the cost of new switch capacity and the cost of growth lines at the time additional capacity is needed. AT&T and MCI also state that considering the costs of growth lines would overstate costs because in other areas of the network, such as loop plant, growth decreases cost.[39] However, AT&T and MCI have presented no evidence that these decreases in costs would equal the increases in costs caused by the purchase of growth lines.

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[37] When asked about switch sizing given the growth information, Dr. Robert A. Mercer stated that "you would add the necessary line modules and switching cards – or should I say line cards – on the trunk side, trunk ports, necessary to meet that growth as it materialized." *Id.*

[38] AT&T/MCI Comments at 11.

[39] AT&T/MCI Comments at 12.

Plainly, there is no rational objection to using actual host/remote configurations and switch placements in determining the forward-looking costs of providing universal service. Accordingly, efforts to develop a mandatory cost proxy model to predict "efficient" switch deployment should be abandoned.

c) Embedded switch bases cannot be ignored in the development of forward-looking switches. (Section III.C.3.c)

AT&T and MCI incorrectly maintain that "relying on the embedded mix of switch types does not reflect the forward-looking optimal network configurations."[40] Such a conclusion implies that when LECs make decisions about where and what type of new technology should be placed in the network, LECs will completely disregard their existing network and corresponding switch types and capacity capabilities. For instance, today, when a LEC decides to place a remote switch, it must consider the available technology in its existing network. If the nearest host switch is of a certain type, such a reality will dictate the type of remote that must be placed. The existing and predicted capacity of the host will also have to be taken into consideration. Yet, the Hatfield Model proponents argue that LECs can put new technology in the network while disregarding the LEC's existing technology base. This assumption, which underlies the switching component of the Hatfield Model, defies logic, compelling that switching costs and platform construction based on this assumption be rejected.

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[40] *Id.* at 8.